

## **AMENDMENTS TO THE CLAIMS**

1. (Currently Amended) An adaptive array antenna system, comprising:
  - modulation means having a plurality of modulators for generating transmitting data corresponding to the number of users;
  - beam forming means having a plurality of beam formers for generating a multiplexed data by multiplexing the generated transmitting data to a beam forming weight;
  - vector addition means for generating sum data by adding outputs of the beam forming means corresponding to a user;
  - array error compensation means for generating an error compensation coefficient of each channel and error compensated data, the array error compensation means multiplexing a reverse of a transfer function of an array transmitting means to the sum data from the vector addition means by using a compensation signal inputted through a frequency down conversion means;
  - array linearization means for receiving the error compensated data from the array error compensation means, generating linearized signal by linearizing the error compensated data by using a frequency down converted signal from the frequency down conversion means and transferring the linearized signal to the array transmitting means, wherein the array linearization means includes non-linear coefficient extraction means for receiving an output signal of the array error compensation means, comparing the output signal and the frequency down converted signal from the frequency down conversion means and extracting a non-linear coefficient of each channel, and pre-distortion means for linearizing the error compensated data from the array error compensation means by multiplexing the extracted non-linear coefficient to the error compensated data;
  - compensation signal extraction means for extracting the compensation signal from an output signal of the array transmitting means and outputting the compensation signal;
  - the frequency down conversion means for generating the frequency down converted signal by frequency-down converting the compensation signal;
  - the array transmitting means for converting the linearized signal from the array linearization means to an analogue linearized signal and frequency-up converting the analogue linearized signal; and
  - array antenna means for transmitting an output signal passed through the compensation signal extraction means,

wherein the array error compensator means sets a first updating period of the error compensation coefficient, and the array linearizer means sets a second updating period of the non-linear coefficient,

wherein the pre-distortion means obtains the transfer function of each channel within a variation period of the transfer function by setting the first updating period to be faster than the second updating period an updating period of the error compensation coefficient is faster than an updating period of the nonlinear coefficient.

2. (Previously Presented) The adaptive array antenna system as recited in claim 1, the array error compensation means includes:

error compensation signal generation means for generating a digital error compensation signal to be injected to a channel in order to estimate the transfer function of the array transmitting means;

error compensation signal injection means for generating digital transmitting data by adding an output vector of the vector addition means and a vector of the digital error compensation signal vector;

error compensation coefficient estimation means for estimating the error compensation coefficient of each channel by considering relation between the compensation signal from the frequency down conversion means and the error compensated signal generated from the error compensation signal generation means; and

error compensation means for multiplexing a reverse of the error compensation coefficient to the digital transmitting data generated from the error compensation signal injection means in each transmitting channel of the array transmitting means and transferring a result of the multiplexing to the array linearization means.

3. Cancelled.

4. (Previously Presented) The adaptive array antenna system as recited in claim 1, wherein the error compensation coefficient is the transfer function of the array transmitting means.

5. Cancelled.

6. (Currently Amended) A linearization method of an adaptive array antenna system, the linearization method comprising the steps of:

- a) generating a transmitting signal corresponding to ~~the~~ a number of users;
- b) generating multiplexed data by multiplexing the transmitting data with a beam forming weight;
- c) generating sum data by adding the multiplexed data;
- d) generating an error compensation coefficient of each channel and error compensated data, the error compensated data being generated by compensating a frequency down converted signal, which is the transmitting signal that passes through a frequency down converter;

d-2-I) receiving the error compensated data from the step d), comparing the error compensated data and the frequency down converted signal and extracting a nonlinear coefficient of each channel;

and

e) linearizing the error compensated data from the step d) by multiplexing the extracted non-linear coefficient of each channel with the error compensated data ,

wherein a first updating period is set for the error compensation coefficient, and a second updating period is set for the non-linear coefficient,

wherein the transfer function of each channel is obtained within a variation period of the transfer function by setting the first updating period to be faster than the second updating period  
~~an updating period of the error compensation coefficient is faster than an updating period of the non linear coefficient.~~

7. (Previously Presented) The method as recited in claim 6, wherein the step d) includes the steps of:

d-1) generating a digital error compensation signal to be injected to a channel in order to estimates a transfer function of an array transmitting means in the adaptive array antenna system;

d-2) generating digital transmitting data by adding the sum data from step c) and the digital error compensation signal from the step d-1);

d-3) estimating the error compensation coefficient by considering a relation between the frequency down converted signal and the digital error compensation signal; and

d-4) multiplexing the digital transmitting signal from the step d-2) and a reverse of the error compensation coefficient from the step d-3).

8-9. Cancelled.

10. (Previously Presented) The method as recited in claim 6, wherein the error compensation coefficient is the transfer function of the array transmitting means.